

HEALTH AND SAFETY PLAN

ENVIRONMENTAL RESPONSE ACTIVITIES

**407-09 VERNON AVENUE AND
5018 ALEXANDER AVENUE
EAST CHICAGO, INDIANA**

Revision 0

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1. INTRODUCTION

The purpose of the HASP is to define the requirements and designate protocols to be followed at the subject site by personnel performing activities described in the Work Plan for Environmental Response Activities (Work Plan). The information in this HASP has been developed in accordance with applicable standards and information available to date. It has been designated to be consistent with the following:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985); and
- OSHA Regulations, particularly those in 29 CFR 1910 and 1926.

2. FACILITY DESCRIPTION

A detailed description of the Facility layout, physical conditions, operations, and waste management practices are provided in the Work Plan.

3. HAZARD EVALUATION

This section identifies and evaluates the potential chemical and physical hazards, which may be encountered during the environmental activities at the subject properties. Site-specific investigation hazards and associated protective measures for each of these activities are outlined in Table 1.

Table 1
Task Specific Hazard Assessment

Task	Hazards	Controls
Drilling (Drill Rig and Geoprobe)	Heavy Equipment	Safe work practices, inspections
	Utility Clearances	Have utility location marked before each drilling event
	Explosion Potential	Monitoring
	Exposure to Chemical Hazards	Monitoring, PPE, respiratory protection
	Electrical Hazards	Proper wiring, grounding and bonding
	Heavy Lifting	Proper lifting techniques
	Slip/Trip/Fall/Hit	Safe work practices
	Temperature Stress	Monitor temperature, proper acclimatization, work rest regimen, drink fluids
	Noise	Hearing protection
	Motor Vehicle Hazards	Spotting, training, operating procedures
Trenching	Heavy Equipment	Safe work practices, inspections
	Excavation Development	Proper sloping and shoring practices
	Utility Clearances	Have utility location marked before each drilling event
	Explosion Potential	Monitoring
	Exposure to Chemical Hazards	Monitoring, PPE, respiratory protection
	Slip/Trip/Fall/Hit	Safe work practices
	Temperature Stress	Monitor temperature, proper acclimatization, work rest regimen, drink fluids
	Noise	Hearing protection
Soil Sampling	Exposure to Chemical Hazards	Monitoring, PPE, respiratory protection
	Slip/Trip/Fall/Hit	Safe work practices
	Temperature Stress	Monitor temperature, proper acclimatization, work rest regimen, drink fluids
	Explosion Potential	Monitoring

3.1 Chemical Hazards

The primary chemical hazards that are anticipated to be encountered during investigation activities at the facility include soil contamination caused by lead.

The material safety data sheet for lead is described in Table 2, which was obtained from www.ScienceLab.com (located at the end of **Section 3**). The contaminants found at this site may be encountered during intrusive activities. The routes of exposure from these contaminants are primarily through inhalation of inorganic vapors and dust, and by direct contact with contaminated soil.

3.1.1 Organic/Inorganic Vapor Inhalation

Exposure to organic/inorganic vapors shall be controlled primarily by the following measures:

- Monitoring can reduce risks by indicating when action levels have been exceeded, and personal protective equipment must be upgraded.
- Using respiratory protection in areas known to have concentrations above the action level.

3.1.2 Respirable Dust Inhalation

Inhalation of respirable dust (potentially containing metals) is possible when conducting intrusive acts. Contaminated soil may become suspended in air due to a combination of factors, including lack of vegetative cover and windy conditions.

When necessary, control of dust shall be obtained as follows:

- When possible, dust control measures may be utilized to suppress the dust. These include wetting the area and providing artificial cover.
- When dust suppression control is not possible, respirators with a HEPA filter may be warranted to prevent against inhalation of dust.

3.1.3 Skin Contact and Absorption

Skin contact by contaminants may be controlled by use of proper personnel protective equipment (PPE) and good housekeeping procedures. The proper PPE as described in Section 5 shall be worn for activities where contact with potentially contaminated media or materials are expected.

3.1.4 Ingestion

Ingestion is controlled through using proper PPE, no eating or drinking or smoking in contaminated areas, and washing hands prior to entering food areas.

3.1.5 Injection

Injection is controlled through reasonable precautions and training, using proper PPE, and removal of sharp objects in the work environment, when possible.

3.2 Physical Hazards

Physical hazards that may be present during these site investigation activities includes potential for injury in proximity to heavy equipment, injury due to utility lines, slip/trip/fall/hit injuries, explosive atmospheres, trenching cave-ins, electrical hazards, and motor vehicle injuries.

3.2.1 Drill Rig Safety

Drilling operations are physically demanding and require highly trained and experienced personnel. Drilling can be extremely hazardous if conducted in an unsafe manner. There is unlimited potential for injury during drilling activities and in most circumstances these injuries can be very severe.

Weaver Boos recommends the following basic safety guidelines to be followed around drilling equipment in an effort to reduce the incidence of work-related accidents.

3.2.1.1 Project Preparation

3.2.1.1.1 Drill Rig Inspection

The inspection of drill equipment is the responsibility of the drilling subcontractor. The driller should inspect his motor vehicle to determine the condition of the brakes, lights, steering, etc. per Federal DOT regulations. Unsafe motor vehicles, in need of repair, should be taken out of service immediately.

Additionally, the driller should carefully inspect the condition of all drilling apparatus (e.g. tools, drive hammer, ropers, etc.). Defective equipment, such as cracked drive hammers, must be taken out of service.

3.2.1.1.2 Drilling Site Preparation

Before entering a drilling site, the drilling crew should conduct a walk-through inspection of the area to determine the location of holes, soft spots, debris, and other obstructions. The site should be cleared of brush, debris, rocks, and other obstructions which might impede work. Additionally, the site should be leveled to safely accommodate the rig.

3.2.1.2 Safety During Travel

3.2.1.2.1 Over the Road

Weaver Boos personnel should be cognizant of proper procedures in order to recognize unsafe practices. We could be held liable for the negligence of our subcontractors. When driving a drill rig or pulling a trailer over the road, the vehicle operator must adhere to the following safety procedures. These requirements remain the primary responsibility of the drilling subcontractor.

1. The vehicle operator must be properly licensed and should operate the vehicle according to federal, state, and local regulations.
2. The operator should inspect his rig before leaving the shop or project site. NEVER move a drill rig unless the vehicle brakes are in good working condition.
3. Ensure that materials and tools are well secured on the rig.
4. Know the traveling height, width, and weight of the rig. Be constantly aware of bridge heights, canopies, low hanging utility lines, trees, etc.
5. Never allow travel on a street, road, or highway with the mast (derrick) raised or partially raised.
6. When towing a trailer, ensure that the hitch and safety chains are secure. Inspect lights and connections.
7. Always be sure bystanders are clear of the vehicle before allowing it to be moved. Walk completely around the rig to ensure obstructions and people are clear.
8. Personnel should never hitch a ride on a moving drill rig.

3.2.1.2.2 Off-Road Travel

1. Before allowing travel off road, inspect the site for depressions, stumps, gullies, and other obstructions.

2. The driller should discharge passengers before moving a drill rig on rough or hilly terrain.
3. If necessary, the driller should engage the front axle to utilize 4 x 4 capabilities.
4. When possible, travel uphill or downhill and avoid side-hill movement.
5. Attempt to cross obstacles such as small logs and ditches squarely, not at an angle.
6. When in position, set brakes and locks on the rig. Block the wheels when grades are steep.
7. Never allow travel off road with the mast (derrick) raised or partially raised.

3.2.1.2.3 Fall Protection

When working on the drill rig derrick or on a ladder above eight feet in height, a safety belt and lanyard must be used.

3.2.1.3 Drill Rig Operation Safety

3.2.1.3.1 Housekeeping

The following good housekeeping practices should be observed for safe drill rig operation:

1. Materials, tools, and supplies should be kept off of the ground and in their appropriate storage locations.
2. Secure tools, drive hammers, augers, etc. prior to moving the rig on or off site.
3. Keep water hoses and catlines coiled and out of the way when not in use.
4. Keep platforms and working areas free of ice, mud, spilled lubricants, and excess tools and equipment.
5. Keep engines free of dirt, excessive grease, and oil and spilled fuel.
6. Keep drill rods, casings, and other equipment not being used free from dirt and stacked in an orderly manner. Stored equipment should be "blocked" to prevent tilting or rolling.
7. Use waste containers to dispose of waste and other trash. Clean work areas at the end of each shift.

3.2.1.3.2 Tool Safety

A vast number of drilling injuries are directly attributed to the use (or misuse) of hand tools. The following are some basic guidelines to follow when working with tools.

1. When using hand tools, especially chisels and hammers, always wear appropriate safety eyewear.
2. Always use the right tool for the job. A screwdriver is not an appropriate replacement for a chisel. Make the effort to get the right type and size tool.
3. Keep tools clean and in good condition. Before using any tool, carefully inspect it. If it is damaged, do not use it.
4. Keep tools in their storage place when not in use.
5. Do not carry tools in pants pockets. Use a tool belt if necessary.
6. Never hand carry tools up and down a ladder. Use a tool belt or hoist them up in a bag.
7. Do not use excessive pressure or force on any hand tool. Pull a tool; do not push.

3.2.1.3.3 Cathead Hoist Safety

Improper use of a cathead hoist can lead to serious injury or death. When required to work around heavy equipment subcontractor personnel should abide by the following safety procedures when operating a cathead.

1. The cathead must be clean, rust free, and in good working condition. Rope grooves greater than 1/8 inch warrant cathead replacement.
2. The cathead rope must be dry and in good condition. A wet rope will grab on the cathead.
3. Keep 18 inches of clearance between the operating hand and the drum. DO NOT wrap the rope around any part of the body.
4. Ensure that the rope is not excessively long and is neatly positioned away from the worker's feet.

3.2.1.3.4 Drive Hammer Safety

1. Drilling personnel should NEVER place their hand on the rods or drive head when the drive hammer is in operation.

2. Prior to each day's work, the drilling subcontractor should carefully inspect the parts of the drive hammer. If hairline cracks or imperfections are detected, the hammer should be permanently taken out of service.
3. Sheave wells, shafts, and pins should be checked daily. They should always be kept well lubricated and should be replaced when worn.

3.2.1.3.5 Auger Safety

1. When working around drilling equipment, stay clear of rotating augers. Never reach behind or around a rotating auger for any reason.
2. The driller should clean augers with a shovel or stick. NEVER clean augers with feet or hands. Also use a shovel to move auger cuttings away from the auger.
3. When helping the drilling subcontractor, remember that augers can be extremely heavy and back injuries can result if improperly lifted. If there is any doubt when lifting, get assistance from a fellow employee or a hoist. Always wear gloves and avoid pinch points when carrying augers.
4. Stay clear of the backup wrench when unscrewing augers.

3.2.1.4 Working with Hazardous Materials

3.2.1.4.1 Site Hazards

Drilling operations may involve potential exposure to hazardous physical and chemical agents. In these circumstances, precautions such as chemical protective clothing and respirators may be necessary. The use of such equipment is likely to increase the potential for physical injuries and the onset heat stress. Therefore, extreme care must be exercised on such projects.

3.2.1.4.2 Routine Chemicals

Many of the substances used every day as a routine part of drilling (i.e. gasoline, bentonite, etc.) must be handled with care. Materials safety data sheets (MSDS) must be maintained on site for hazardous materials in use.

If using gasoline or other flammables, remember the following basic safety rules:

1. NO SMOKING around any gasoline or flammable container.

2. Gasoline cans must be approved safety cans, properly labeled, and equipped with flash arresters.

3.2.1.5 Emergency Equipment

At a minimum, the following emergency equipment must be accessible at each drilling site. NO EXCEPTIONS!

1. A,B,C-rated fire extinguisher
2. First aid kit
3. Traffic cones or reflective traffic triangles
4. Emergency phone numbers

3.2.2 *Utility Clearance*

Extreme caution must be exercised at all times when working in close proximity to overhead and underground utilities. Adherence to the following safety procedures will substantially reduce the likelihood of utilities-related injury or death.

3.2.2.1 Overhead Utilities

Overhead wires at a site should be considered alive and dangerous.

Maintain at least 30 feet of clearance in all directions between the wires and the derrick, rods, or other parts of the rig. Remember: Under the right conditions, electricity can arc between the wires and the drill rig. Always allow extra room for swaying of the drill rods and electrical lines.

If drilling must take place within 30 feet of overhead lines, the driller must contact the local power company for their assistance. In many instances, they can temporarily shut down the power or insulate the lines. Plan ahead for such situations.

If the boring cannot be drilled safely because of overhead lines, do not attempt to drill the boring.

Never lift power lines to gain access to the site.

3.2.2.2 Underground Utilities

1. **ALWAYS** contact the local utilities location service prior to drilling at a site.

2. If the exact location of underground utilities cannot be determined by a utilities marking service, Weaver Boos will use the following methods to verify the location:
 - a) Check with the building owner and refer to building diagrams.
 - b) Utilize magnetic or other similar detection devices.
 - c) Hand auger or dig before drilling
3. Once underground utilities are located, maintain several feet of clearance from the marking. Remember, some conduits or piping can be several feet in diameter.

3.2.2.3 Contact of Drilling Rig with Utilities

If a drill rig does come into contact with overhead or underground utilities, stay clear of the rig. Immediately contact the utility and emergency personnel.

3.2.3 *Slip/Trip/Fall/Hit*

Slip/Trip/Fall/Hit injuries are the most frequent of all injuries to workers. They occur for a wide variety of reasons, but can be minimized by the following prudent practices:

- Spot check the work area to identify hazards.
- Establish and utilize a pathway which is most free of slip and trip hazards.
- Beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain.
- Carry only loads which you can see over.
- Keep work areas clean and free of clutter.
- Communicate hazards to on-site personnel.
- Secure loose clothing, ties, and remove jewelry while around machinery.
- Report and/or remove hazards.
- Keep a safe buffer zone between workers using equipment and tools.

3.2.4 *Explosive Atmosphere*

The potential for an explosive atmosphere exists when the following conditions occur: (1) the level of combustible gases accumulate to within the explosive limit range; (2) the gas is generated in the presence of oxygen; and (3) there is a source of heat or ignition.

Explosive conditions may be controlled in the following manner:

- Monitoring air concentrations for explosive gases shall be conducted in the immediate area of source (s) with a Combustible Gas Indicator (O₂/LEL meter). Monitoring can reduce risks by indicating when action levels have been exceeded. These action levels and appropriate contingencies are described in Table 7.
- Intrinsically safe equipment shall be used whenever possible (if no other control measures are utilized intrinsically safe equipment is required).

3.2.5 *Heavy Lifting*

When lifting objects, use the following proper lifting techniques:

1. Keep your feet shoulder width apart to get the best footing possible.
2. Bend at the knees, not at the waist.
3. Tighten stomach muscles to offset the force of the load.
4. Grasp the object at opposite corners.
5. Lift with the legs instead of the back muscles.
6. Keep the back upright and avoid twisting.
7. Most importantly, think before lifting.

3.2.6 *Electrical Hazards*

No employee shall be permitted to work in the proximity of any part of an electrical power circuit unless the person is protected against electric shock by de-energizing the circuit and grounding it, or by having the circuit locked and tagged out.

- Electrical wiring and equipment must be of a type listed by UL or Factory Mutual Engineering Corporation for the specific application.
- Installations must comply with the National Electrical Safety Code (NESC), National Electrical Code (NEC), or U.S. Coast Guard regulations.
- Electrical work must be by personnel familiar with code requirements and qualified for the class of work to be performed.

- Live parts of wiring or equipment must be guarded to protect persons or objects from harm.
- Electrical wiring passing through a work area must be covered or elevated in order to protect it from damage by vehicles, foot traffic, projections, sharp corners, or pinching. This includes temporary wiring.
- If it is necessary to work on energized lines or equipment, rubber gloves and other protective equipment or hotline tools designed to meet the provisions of the American National Standards Institute (ANSI) J-6 series will be used.
- Before any work is initiated, ascertain by inquiry, direct observation, or instruments whether any part of an electrical power circuit, exposed or concealed, is located in such a way that allows contact with persons, tools or machines. Whenever possible, de-energize equipment or circuits to be worked on before work is started, and make sure that personnel are protected by clearance procedures and grounding.
- Patched, oil soaked, worn or frayed electrical cords must not be used.
- Do not hang extension cords with staples or nails, or suspend them from base wire.
- Portable and semi-portable electrical tools and equipment, floodlights and work lights must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Flexible cord sets must be of a type listed by Underwriters Laboratories. Sets used on construction sites will contain the number of conductors required for the service plus an equipment ground wire. The cords must be Type ST, STO, SJT, SJTO, S, SO, SEO, W, or G.
- Portable electrical lighting used in confined, wet, or hazardous locations (drums, tanks, vessels) must be explosion proof or low voltage, operating at 12 volts or less.
- No work will be permitted during any type of electrical storm.
- Employees should be aware of the fact that high voltage is not necessary for serious electric shock.

3.2.7 *Excavation and Trenching*

Trenching and excavation activities involve potential hazards which may bear serious consequences. These include slope failure (cave-ins); utilities (both underground and overhead); overhead hazards due to objects falling in the trench or bumping into bracing; and slip, trip and fall hazards. The following procedures represent the absolute minimum considerations which must be addressed prior to any excavation.

Any excavation greater than four feet in depth, must comply with Federal OSHA 29 CFR 1926.650-653 or applicable state requirements for acceptable angle of repose and/or shoring. The acceptable angle of repose may have to be modified in extremely wet, extremely dry or other unusual circumstances. No employee shall enter any pit or trench unless it is properly shored or laid-back, or other appropriate precautionary measures such as the use of a trench box are employed.

Check the location of gas, water, telephone, and electric utilities prior to any excavation.

Crane booms and high voltage transmission lines present an extreme hazard. If excavation must be performed in the vicinity of such lines, an alternative method should be considered. If a crane must be used, maintain at least 30 feet of clearance from active power lines.

Tools, equipment, and excavated material must be kept at least two feet from the edge of the trench.

Employees must always wear a hard hat when entering any excavation.

Certain pits and trenches may be "confined-spaces" and must be treated as such, especially at landfill or hazardous waste sites.

Standing or walking on braces or stringers is strongly discouraged. If there is no alternative, be sure that the standing/walking surface, and shoes/boots are dry and free of mud.

3.2.8 *Motor Vehicle Safety*

3.2.8.1 Driver Safety

The following motor vehicle operator regulations shall be employed when operating a vehicle. The driver shall:

- Review pertinent information such as manufacturer's operating instruction, company procedures, and maintenance records.
- Review safe operating techniques and signals.
- Wear seat belts at all times.
- Confirm that the mobile equipment safety devices are functional.
- Operate only his or her own vehicle or a company vehicle.
- Operate only properly maintained vehicles.
- Personnel may not operate any vehicle after having consumed alcohol and/or drugs, including legal drugs, which may impair their ability to operate that motor vehicle. Table 3 provides vehicle safety measures.

3.2.8.2 Worker Safety While Working in Proximity to Motor Vehicles

Personnel working in the close vicinity of a motor vehicle shall do the following:

- Continuously check the activities of the vehicles operating nearby which may present a hazard.
- Refrain from activities that might distract the vehicle operator.
- Use high visibility clothing. Reflective clothing should be worn by personnel working in a high traffic area, in times of darkness or reduced lighting and under rainy or foggy conditions.

Table 3
Vehicle Safety

Activity	Safety Measure
Entering and Exiting the Truck Cab	<ul style="list-style-type: none"> • Keep the surface of steps free and clear of debris such as gravel, waste materials, ice and snow. • Check the condition of each step and hand hold prior to using it to dismount. • Clean steps and hand holds prior to re-entering the vehicle. • Open the cab door slowly, being alert for hazards such as operating equipment or other vehicles. • Use steps and grab handles for mounting and dismounting. • When entering or exiting, always have at least three limbs in contact with the vehicle at all times. • Never jump out of the truck. • No one is to attempt to exit or enter the cab unless the vehicle is at a complete stop. • The vehicle operator should stop the unit in an open area that will not expose persons to traffic hazards. • Except while frequently entering and exiting the cab during collection activities, seat belts should be worn at all times by all persons in the cab.
Malfunctioning or Inoperative Equipment	<ul style="list-style-type: none"> • Operators shall immediately provide a report to their supervisors of any damage to or malfunction or the equipment or safety devices. • No one shall operate equipment if any malfunction or breakdown poses a threat to safety. • No one shall operate a vehicle if an “out of service” condition exists as defined in transportation regulations. • Operators shall continuously monitor equipment and safety devices for proper operation. • Management and supervisory personnel will not permit mobile equipment with malfunctioning or inoperative safety equipment to be used (ANSI Standard). • No one will deliberately disable or bypass safety interlocks or other protective equipment (ANSI Standard).

4. KEY PERSONNEL

Personnel conducting activities on-site for which potential exposure exists must be in compliance with applicable federal and state rules and regulations, including OSHA 29 CFR 1910.120, and OSHA 29 CFR 1926. On-site personnel and visitors must verify that they have received OSHA 40-hour hazardous waste site worker training and be familiar with the procedures and requirements of this Health and Safety Plan (HASP). In the event of conflicting safety procedures or requirements, personnel must implement those safety practices which afford the highest level of protection.

An initial site-specific training session or briefing shall be conducted by the SPM prior to commencement of work and/or entering the site. This briefing will familiarize personnel and any visitors with the procedures, requirements, and provisions of this HASP. Furthermore, if deemed necessary by the Health and Safety Officer, on-site personnel and any visitors shall sign a Plan Acceptance Form to document that they have: (1) attended a pre-entry briefing, (2) received and read a copy of the HASP; and (3) agreed to comply with the HASP.

The following are descriptions of the project personnel responsible for implementing the health and safety requirements outlined in this HASP.

4.1.1 Health and Safety Officer

The Health and Safety Officer (HSO) shall have overall QA/QC responsibility for the development and implementation of the HASP. In cases where the SSO and the project management/personnel do not agree to the content and/or implementation of the HASP, the HSO shall be contacted to make the necessary evaluation.

4.1.2 Senior Project Manager

The Senior Project Manager (SPM) shall be responsible for the overall implementation of the HASP and for ensuring that health and safety procedures and policies are carried out in conjunction with this project. This shall include, but is not limited to:

- Review and approve the HASP.
- Communicate site requirements to project personnel and subcontractors by means of a pre-entry meeting.

- Communicate site requirements to on-site visitors by means of a pre-entry meeting.
- Consult with the HSO regarding appropriate changes to the HASP.
- Relate any changes to site personnel.

4.1.3 Site Safety Officer

The Site Safety Officer (SSO) may be appointed by the SPM and approved by the HSO prior to the commencement of field activities. The SSO is the person who, under the supervision of the SPM, is responsible for ensuring that the following items are accomplished:

1. On-site personnel and visitors have verification of current OSHA 40-hour hazardous waste site training;
2. On-site personnel and visitors receive a copy of the HASP, understand its contents, and complies with the contents;
3. Designates appropriate personal protective equipment for the work;
4. Necessary maintenance and decontamination of safety equipment is conducted by on-site personnel;
5. If any emergency occurs on-site, the local emergency services are contacted;
6. The forms attached to this HASP are completed and submitted to the HSO upon completion of field activities, including the Plan Acceptance Form, Instrument Calibration Form, and the Medical Data Sheet; and
7. The Medical Data Sheet is completed and kept on-site.

During on-site activities, the SSO has the authority to:

1. Suspend field activities or otherwise limit exposure if the health or safety of any person appears to be endangered;
2. Direct company or subcontractor personnel to alter work practices that endanger human health or the environment; and
3. Suspend an individual from field activities for an infraction of the requirements of the HASP.

5. PERSONAL PROTECTIVE EQUIPMENT

5.1 General

The purpose of personal protective equipment (PPE) is to shield or isolate individuals from the chemical and physical hazards that may be encountered during work activities. Full-face respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The level of protection must correspond to the level of hazard known, or suspected, in the specific work area, and is designated by the Site Safety Officer (SSO). The specific levels of protection and necessary components for each have been divided into four categories according to the degrees of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

Level C: Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modified Level D: Should be worn when the criteria for skin protection is met.

PPE has been selected with specific consideration to the hazards associated with each specific task. The specific PPE to be used for each level of protection described above is located in Table 4, below.

Table 4
PPE Levels of Protection

<p>Level “D” will consist of the following:</p> <p>Steel-toed boots, hard hat, and hearing protection (if necessary)</p>
<p>Modified Level “D” will consist of the following:</p> <p>Tyvek coveralls, steel toed boots, safety goggles, Nitrile gloves neoprene outer gloves (22 mil thickness), chemical-resistant boot covers, hard hats, and hearing protection.</p>
<p>Level “C” will consist of the following:</p> <p>Sarnex coveralls, steel-toed boots, safety glasses, full-faced air purifying respirator equipped with organic vapor - acid gas combination cartridge with attached HEPA filter, Nitrile inner gloves, neoprene outer gloves (22 mil thickness) chemical-resistant boot covers, hard hat, and hearing protection.</p>
<p>Level “B” will consist of the following:</p> <p>Sarnex coveralls, positive pressure, full-faced self-contained breathing apparatus or supplied air respirator, inner surgical gloves, and outer Nitrile/neoprene or Viton gloves (22 mil thickness), chemical-resistant boot covers, steel-toed/steel-shanked boots, hard hat, and hearing protection.</p>

5.2 PPE for Visitors

Appropriate safety equipment and sets of PPE ensembles for each day shall be kept in the Support Zone in order to provide the proper protection for authorized visitors who require access to the Exclusion Zone (see Section 7.0 for a discussion of the Support Zone and the Exclusion Zone). This will include hard hats, safety glasses and other various, non-personal items. Personal items such as safety boots must be provided by the visitor and must be worn on-site. In addition, if deemed necessary by the Weaver Boos HSO, visitors must undergo on-site pre-entry training and sign off to certify that they have completed such training.

5.3 Air Purifying Respirators

The air purifying respirator cartridges selected for use during Level “C” work at this site are organic vapor/acid gas cartridges with high efficiency dust filters, which have the ability to protect against total organic vapor concentration up to 1,000 ppm, 10 ppm chlorine, 50 ppm hydrogen chloride, and 50 ppm sulfur dioxide. The attached HEPA filter will protect against dust, mist and fumes having a TWA greater than 0.05 mg/m³; asbestos-containing dusts and mists; and radionuclides.

5.3.1 Respirator Fit Test

Personnel who may be required to wear a negative-pressure, air purifying respirator shall be fitted properly and tested for a face seal at least annually. In addition, any person using a negative-pressure respirator must be medically cleared to do so. Employees shall have the opportunity to handle the respirators, and wear them in normal air for a familiarity period. Following the familiarity period, employees shall test the piece-to-face seal by use of the positive and negative pressure tests:

- Positive Pressure Test – with the exhaust port(s) blocked, the positive pressure of slight exhalation should remain constant for several seconds.
- Negative Pressure Test – with the intake ports blocked, the negative pressure of slight inhalation should remain constant for several seconds.

Air purifying respirators shall not be worn when conditions prevent a seal of the respirator to the wearer. Such conditions may be the growth of a beard, sideburns, a skull cap that projects under the face-piece, or temple pieces on glasses. No employee may wear a beard if it interferes with the fit of the respirator. Also, the absence of one or both dentures can seriously affect the fit of a face-piece, and should be worn during all times that respirators are being used. The worker’s diligence in observing these factors shall be evaluated by periodic checks.

5.3.2 Cartridge Changes

Cartridges will be changed a minimum of twice daily. Changes will also be made when personnel begin to experience increased inhalation resistance or breakthrough of a chemical warning property, such as an odd taste, odor or sensation.

5.3.3 *Cleaning and Disinfecting Air Purifying Respirators (APR)*

APRs in routine use should be cleaned and disinfected at least daily. Where respirators are used only occasionally, or when they are in storage, the cleaning interval is weekly or monthly, as appropriate.

5.3.3.1 Daily Cleaning Procedure

The steps to be followed for cleaning and disinfecting daily are as follows:

1. **Respirator Disassembly.** Respirators are taken to a clean location where the filters, cartridges or canisters are removed, damaged to prevent accidental reuse, and discarded. For thorough cleaning, the inhalation and exhalation valves, speaking diaphragm, and any hoses are removed.
2. **Cleaning.** In most instances, the cleaning and disinfecting solution provided by the manufacturer is used, and is dissolved in warm water in an appropriate tub. Using gloves, the respirator is placed in the tub and swirled for a few moments. A soft brush may be used to facilitate cleaning.
3. **Rinsing.** The cleaned and disinfected respirators are rinsed thoroughly in water to remove traces of detergent and disinfectant. This is very important for preventing dermatitis.
4. **Drying.** The respirators may be allowed to dry in room air on a clean surface. They may also be hung upside down like drying clothes, but care must be taken not to damage or distort the facepieces.
5. **Re-assembly and Inspection.** The clean, dry respirator facepieces should be reassembled and inspected in an area separate from the disassembly area to avoid contamination. Special emphasis should be given to inspecting the respirators for detergent or soap residue left by inadequate rinsing. This appears most often under the seat of the exhalation valve, and can cause valve leakage or sticking.

5.3.4 *APR Inspection and Checkout*

1. Visually inspect the entire unit for any obvious damages, defects, or deteriorated rubber.
2. Make sure that the facepiece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.

3. Inspect lens for damage and proper seal in facepiece.
4. Exhalation Valve - pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage).
5. Inhalation Valves (two) - screw off cartridges / canisters and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.
6. Make sure a protective cover lens is attached to the lens.
7. Make sure the speaking diaphragm retainer ring is hand tight.
8. Make sure that you have the correct cartridge.
9. Don and perform negative pressure test.

5.3.5 Storage of Air Purifying Respirators

OSHA requires that respirators be stored to protect against:

- Dust
- Sunlight
- Heat
- Extreme cold
- Excessive moisture
- Damaging chemicals
- Mechanical damage

Storage of respirators should be in a clean, secure area which minimizes the chance for contamination or unsanitary conditions.

5.4 Air Supplied Respirators

5.4.1 Specific Requirements for the Use of Air Supplied Respirators

Air supplied respirators may be used under certain conditions during field activities, most notably emergency conditions. The types of air supplied respirators that may be used include:

- Air line respirators

- Self-contained breathing apparatus (SCBA) respirators

5.4.2 *Training*

Employees that use respirators must be medically cleared to do so and must have passed a qualification fit test. Personnel who shall be required to use air supplied respirators shall be trained in their uses, limitations and property checkout procedures to be followed prior to use.

5.4.3 *Breathing Air*

Breathing air used in air supplied respirators shall meet the requirements of the specifications for Grade D breathing air as specified by the Compressed Gas Association. Breathing air used shall be obtained from a compressed gas supplier in appropriate gas cylinders, and labeled as to its contents and standards. No unlabeled cylinders shall be used regardless of any assurances made by the supplier as to its contents.

5.4.4 *Inspection, Checkout and Maintenance*

Monthly Inspection:

1. Check cylinder label for current hydrostatic test date.
2. Inspect cylinder for large dents or gouges.
3. Inspect cylinder gauge for damage.
4. Complete routine inspection
5. Fill out the appropriate records with results and recommendations.

Routine Inspection: Perform immediately prior to donning or after cleaning.

1. Before proceeding, check that the:
 - a) High-pressure hose connector is tight on cylinder fitting.
 - b) By-pass valve is closed.
 - c) Mainline valve is closed.
 - d) Regulator outlet is not covered or obstructed.
2. Backpack and harness assembly:
 - a) Visually inspect straps for wear, damage, and completeness.
 - b) Check wear and function of belt.

- c) Check backplate and cylinder holder for damage.
- 3. Cylinder and high pressure hose assembly:
 - a) Check cylinder to assure that it is firmly attached to backplate.
 - b) Open cylinder valve; listen or feel for leakage around packing and hose connection.
 - c) Check high pressure hose for damage or leaks.
- 4. Regulator:
 - a) Cover regulator outlet with palm of hand.
 - b) Open mainline valve.
 - c) Note stoppage of air flow after positive pressure builds.
 - d) Close mainline valve.
 - e) Remove hand from regulator outlet.
 - f) Open bypass valve slowly to assure proper function.
 - g) Close bypass valve
 - h) Open mainline valve.
 - i) Note pressure reading on regulator gauge.
 - j) Close cylinder valve while keeping hand over regulator outlet.
 - k) Slowly remove hand from outlet and allow air to flow.
 - l) Note pressure when low-pressure warning alarm sounds; it should be between 550-650 psi.
 - m) Remove hand from regulator outlet.
 - n) Close mainline valve.
 - o) Check regulator for leaks by blowing air into regulator for 5-10 seconds. Draw air from outlet for 5-10 seconds. If a positive pressure or vacuum cannot be maintained, there is a leak. **DO NOT USE SCBA.**
- 5. Facepiece and corrugated breathing hose:
 - a) Facepiece and corrugated breathing hose:
 - b) Inspect hand harness and facepiece for damage, serration's, and deteriorated rubber.
 - c) Inspect lens for damage and proper seal in facepiece. Inspect exhalation valve for damage and dirt build-up.
 - d) Stretch breathing hose and carefully inspect for holes and deterioration.

- e) Inspect connector for damage and presence of washer.
 - f) Perform negative pressure test with facepiece donned.
6. Storage:
- a) Refill cylinder to 2216 psi.
 - b) Close cylinder valve.
 - c) Tightly connect high pressure hose to cylinder.
 - d) Bleed pressure from high pressure hose by opening mainline valve.
 - e) Close by-pass valve.
 - f) Close mainline valve.
 - g) Fully extend all straps.
 - h) Store facepiece in a clean plastic bag for protection.

Repair and/or maintenance of air supplied respirators shall only be conducted by the manufacturer or a trained repair technician.

5.4.5 Safety Requirements When Air Supplied Respirators are in Use

Whenever personnel are conducting work in air supplied respirators several safety precautions must be followed. First, the presence of one standby person who is equipped with rescue gear (SCBA) to assist in any rescue that may become necessary. Second, direct communication must be kept between the standby person and any personnel working in air supplied respirators. The communication may vary depending upon the type of site, and the anticipated hazards. Some examples of communication systems that may be used include:

- Two-way radios used between standby person and entrants.
- Visual observation and the use of hand signals.
- Use of air horns or other similar devices.

5.4.6 Special Consideration for Self-Contained Breathing Apparatus Use

- When using a SCBA, the following items shall be conducted and/or adhered to.
- SCBAs shall be operated in the positive pressure mode at all times that an individual is in a hazardous atmosphere. SCBA may be operated in the demand mode only during the time period required for the person to actually enter the hazardous atmosphere.

- When the tank reaches approximately 20 percent capacity, an alarm bell will sound. At that point, the entrant shall immediately abandon the task being conducted and proceed to the “clean” area where the tank can be changed.
- The standby person shall assist entrants during tank change and tank fill operations.

5.4.7 Special Considerations for Air Line Respirator Use

When using air line respirators, the following items shall be conducted and/or adhered to:

- Air line respirators used shall be equipped with a 5 minute escape bottle to be used in case of air line restriction or other emergency.
- Standby person shall monitor the air supply that is maintained in the “clean” area at all times when personnel are using air line respirators.
- Standby person shall notify entrants if a problem arises.

6. EXPOSURE MONITORING

Inhalation hazards are caused from the intake of vapors and contaminated dust. Air monitoring shall be performed within work areas to detect the presence and relative level of those air contaminants which are inhalation hazards. Monitoring shall also be conducted to identify other hazardous situation, such as the presence of flammable or explosive atmospheres, and/or oxygen deficient environments.

The data collected throughout the monitoring effort shall be used to determine the appropriate levels of protection.

6.1 Exposure Monitoring

Air monitoring equipment to be used during site activities described in Section 3.1, shall consist of a combustible gas indicator (LEL meter).

6.1.1 LEL and O₂ Meter

If personnel are in an area where explosive vapors and an oxygen deficient environments could occur a Lower Explosive Limit (LEL) and Oxygen (O₂) meter will be utilized (refer to Appendix C for operating instructions.) The combustible gas indicator scales read from 0 to 100% of the LEL . An alarm on the O₂ meter will sound when the oxygen level falls below 19.5% or rises above 22%. LEL and O₂ monitoring shall be conducted in the work area directly above the emission source.

6.2 Monitoring Frequency

If required, monitoring with the LEL/O₂ meter shall be conducted continuously in potentially explosive or oxygen-deficient environments. The respirable dust meter will be used during excavation activities only.

6.3 Health and Safety Action Levels

An action level is a point at which increased protection or cessation of activities is required due to the concentration of contaminants in the work area. The initial level of protection will be Level D. The appropriate action to be taken at a designated action level is described in Table 7.

In addition to Table 7, an upgrade to Level “C” is required if:

- Any symptoms occur, as described in Table 2.
- Requested by an individual performing the task.
- Any irritation to eye, nose, throat, or skin occurs.

An upgrade to Level “B” during any activity is required if:

- Activities are conducted in areas of confined or enclosed spaces.
- Odors are detected while wearing air purifying respirators (APR).
- Concentrations exceed safe APR use limits (50 x PEL for full face respirator).
- IDLH conditions exist.

WARNING: If any activities occur in “confined or enclosed spaces”, a Confined Space Entry Program must be developed and implemented. No entry to a confined space is allowed otherwise.

Table 5

(Reserved)

Table 6
Air Monitoring Requirements

Monitoring Instrument	Monitoring Frequency	Working Range
Combustible Gas Indicator (LEL/O ₂ Meter)	Continuously in potentially explosive or oxygen deficient environments	1 to 100% LEL 0 to 25% O ₂

Table 7
Action Levels for Field Activities

Monitoring Instrument	Hazard	Instrument Reading	Level of PPE
Combustible Gas Indicator (LEL Meter)	Explosive Atmospheres *	< 10% LEL	Continue investigation
		10% to 20% LEL	Work with caution. Monitor continually.
		> 20%	Leave work area

* Above background, measured at the source of emission.

7. SITE CONTROL AND WORK ZONES

The purpose of site control is to minimize potential contamination of workers and protect the public from hazards found on-site. Site control is especially important in emergency situations where the potential for exposure to hazards is increased.

7.1 Work Zones

An essential measure toward reducing the migration of contaminants is to delineate the site into three specific work zones. The three zones include the Exclusion Zone, the Contamination Reduction Zone, and the Support Zone. Movement of personnel and equipment must be through designated access control points. If determined necessary by the Weaver Boos Health and Safety Officer, personnel entering the exclusion zone must first review the site safety plan and must sign in.

7.1.1 Exclusion Zone

The Exclusion Zone, the innermost of the three zones, shall be established in the area where contamination does or could exist. The outer-most boundary of the Exclusion Zone is the Hotline. Any Weaver Boos personnel, subcontractors, or site visitors who cross over the Hotline and into the Exclusion Zone must wear necessary protective equipment as prescribed in the site safety plan.

7.1.2 Contamination Reduction Zone

The CRZ, the zone between the Exclusion Zone and Support Zone, serves as a transition buffer area to prevent the spread of contamination. The Contamination Reduction Corridor (CRC), or decontamination line, is located within the CRZ. Exit from the Exclusion Zone must be through the CRC, where equipment and personnel undergo decontamination. A CRC for heavy equipment decontamination may be designated separate from the personnel CRC. The area in and around the CRC may become contaminated, although to a lesser degree than the Exclusion Zone. For this reason, personnel entering the CRZ must wear protective equipment as specified in the site safety plan. No contamination shall extend beyond the Contamination Control Line which separates the CRZ from the Support Zone.

7.1.3 Support Zone

The Support Zone, the outermost zone on the work site, shall be established in the non-contaminated or clean area. Support equipment (office trailer, laboratory trailer, etc.) is designated for this area. Contaminated personnel, equipment, or samples, are not permitted within this zone. Personnel operating within the Support Zone are not required to wear special protective equipment.

7.1.4 Determining Work Zone Dimensions

Proper size and placement of each work zone must be determined in order to provide adequate distances to prevent the spread of contaminants, allow room to conduct operations, and to eliminate the possibility of injury due to explosion or fire. Work zone dimensions and boundaries shall be established based upon the following:

- Physical and topographical features of the site
- Weather conditions
- Field/laboratory measurements of air contaminants and environmental samples
- Potential for fire, explosion, and flying debris
- Physical, chemical, and other characteristics of the substances present
- Cleanup activities required
- Area needed to conduct operations
- Decontamination procedures
- Potential for exposure
- Proximity to residential or industrial areas.

7.2 Communications

Successful communications between field teams and contact with personnel in the support zone is essential. The following communications systems will be available during activities at the subject properties.

- Radios: Two (2) ways
- Compressed air horn.

- Hand Signals as follows:

<u>Signal</u>	<u>Definition</u>
Hands clutching throat	Out of air/can't breath
Hands on top of head	Need assistance
Thumbs up	OK or I'm all right
Thumbs down	No or negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

7.3 Buddy System

During activities presenting a risk to personnel, the implementation of a buddy system is mandatory. A buddy system requires at least two people who work as a team; each looking out for each other. A buddy system shall be implemented when conducting trenching or soil sampling activities on this site when weather conditions or chemical levels exceed the action levels and require PPE to be upgraded from Level D to Level C.

8. SITE SECURITY

In addition to overall site security, specific security of a contaminated work zone is necessary to prevent the exposure of unauthorized, unprotected people to hazards and to avoid interference with safe working procedures. Security shall be maintained in the Support Zone through the use of barriers and/or warning signs, which should be placed surrounding the work zones. Employees and visitors should be aware of the hazards associated with the area and the seriousness of the barriers and warning signs. Everyone entering the support zone (Weaver Boos employees, subcontractors, client representatives, visitors, etc.) will sign in and out of the support zone any time they enter or leave.

9. DECONTAMINATION

It is the responsibility of the Site Safety Officer to ensure that personnel and pieces of equipment coming off-site are properly decontaminated according to the procedure outline below. Documentation of decontamination must be made in the field log notebook that will become part of the permanent project file.

9.1 Contamination Prevention

One of the most important aspects of decontamination is the prevention of the spread of contamination. Good contamination prevention will minimize employee and public exposure, and help ensure valid sample results by eliminating cross-contamination. Proper decontamination procedures and following procedures of contamination avoidance shall reduce the potential spread of contamination, including:

- Do not walk through areas of obvious or known contamination.
- Do not handle or touch contaminated materials directly.
- Fasten closures on suits, covering with tape as necessary.
- Take particular care to protect any skin injuries.
- Stay upwind of airborne contaminants, when possible.

9.2 Personal Decontamination

A personnel decontamination area will be established in the Contamination Reduction Zone for necessary field activities. Personnel exiting the Exclusion Zone directly into the Contamination Reduction Zone will follow decontamination procedures. Under no circumstances (except emergency evacuation or other medical emergencies) will personnel be allowed to leave the site prior to decontamination.

PPE will be disposed of and/or decontaminated at the conclusion of each workday and replaced with new equipment prior to commencing work. In addition, respirator cartridges will be replaced when breakthrough is obtained, as directed by the SSO. Designated containers for Tyvek suits and other disposable items will be located in the Contamination Reduction Zone.

Respiratory equipment and other non-disposable items will be fully decontaminated and then placed in a clean storage area. Respirator decontamination will be conducted daily. Taken from the drop area, the facepieces will be disassembled, the cartridges set aside, and other parts placed in a cleansing solution. After an appropriate time in the solution, the parts will be removed and rinsed with tap water. Facepieces will be allowed to air dry before placing in sanitized bags. Personnel will inspect their respiratory on a daily basis to ensure its property operation.

9.2.1 Level "D" Decontamination

Level D decontamination procedures to be utilized when leaving the Exclusion Zone are as follows:

Step 1 - Properly discard disposable personal protective equipment along with other wastes generated on-site.

Step 2 - Wash and rinse both hands and face.

9.2.2 Modified Level "D" Decontamination

Step 1 - Remove visible contamination and loose debris by washing with clean water.

Step 2 - Remove outer clothing that came in contact with the contamination (i.e., boot covers and outer gloves) and either dispose of in a disposable container or wash in detergent solution and rinse.

Step 3 - Remove protective clothing and dispose of in a disposable container

Step 4 - Wash and rinse hands.

9.2.3 Level "C" Decontamination

Level C decontamination procedures to be utilized when leaving the Exclusion Zone are as follows:

Step 1 – Remove visible contamination and loose debris by washing with clean Deionized water.

Step 2 – Remove outer clothing that came in contact with the contamination (i.e., boot covers and outer gloves) and either dispose of in a disposable container or wash in detergent solution and rinse.

Step 3 – Remove protective clothing; dispose of in a disposable container.

Step 4 – Remove respirator and place in designated container for complete sanitation.

Step 5 – Remove inner gloves inside out. Place in plastic lined drums.

Step 6 – Wash and rinse hands

9.2.4 Level “B” Decontamination

Level B decontamination procedures to be utilized when leaving the Exclusion Zone are as follows:

Step 1 – Remove visible contamination and loose debris by washing with clean Deionized water.

Step 2 – Remove outer clothing that came in contact with the contamination (i.e., boot covers and outer gloves) and either dispose of in a disposable container or wash in detergent solution and rinse.

Step 3 – Remove protective clothing; dispose of in a disposable container.

Step 4 – Disconnect facepiece hose from regulator; remove SCBA tank and airline.

Step 5 – Remove respirator and place in designated container for complete sanitation.

Step 6 – Remove inner gloves inside out. Place in plastic lined drums.

Step 7 – If a shower trailer is available, thoroughly shower with soap and water. Wash and rinse hands

9.3 Emergency Decontamination

In the event of an on-site medical emergency, a decision must be made regarding decontamination if the injury occurs in an area of chemical contamination. There is a possibility that decontamination procedures may aggravate or cause more serious health effects.

For minor medical problems or injuries, the normal decontamination procedures should be followed.

If prompt life-saving first aid and medical treatment is required, decontamination procedures may have to be omitted. In such circumstances, the following guidelines should be used:

- If possible, remove outer protective coveralls and clothing by cutting away if necessary.
- If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic, blankets, etc. to prevent contaminating medical personnel and vehicles.

If possible, a Weaver Boos representative from the project site should accompany the contaminated victim to the medical facility to advise on matters involving decontamination.

9.4 Equipment Decontamination

9.4.1 Sampling and Monitoring Equipment

Delicate sampling and air monitoring equipment is very difficult to clean without damaging, once it has been contaminated. Weaver Boos personnel shall carefully wrap such instrumentation in plastic prior to entering the Exclusion Zone in such a manner which allows proper operation of the device.

Contaminated equipment will be taken from the drop area and shall be decontaminated as follows:

- The protective coverings shall be removed and disposed of in the appropriate containers.
- Monitoring equipment will be wiped down with a disposable paper wipe.

9.4.2 Heavy Equipment

Bulldozers, trucks, backhoes, etc. may require decontamination in certain circumstances. Such heavy equipment will be dry decontaminated utilizing appropriately sized hand equipment. In addition, if necessary a combination of high pressure water wash, and/or steam cleaning, and/or hand scrubbing with decontamination solution may be used. Run-off from the area must be prevented using polyethylene plastic and/or a sump system.

9.5 On-Site Contaminated Equipment Area

The contractor shall provide on on-site contaminated equipment storage area at the entrance point to the Contamination Reduction Zone from the Exclusion Zone. The on-site contaminated

equipment storage area shall be lined with polyethylene. The contaminated equipment storage area shall include the following:

- Drums or sealed containers for the disposal or protective clothing.
- A 10-foot by 10-foot temporary structure for the storage of contaminated materials and equipment used daily (if necessary).
- Supplies and equipment will be disposed at the disposal facility accepting the soil.

10. ACCIDENT PREVENTION

A vital element of the Health and Safety program is the implementation of an accident prevention program. An accident prevention program, as applicable to this site, includes the following measures:

- Designate a Site Safety Officer (SSO) who will be ultimately responsible for the following items.
- Communicate the contents of this HASP to personnel who work on the site.
- Educate personnel as to the requirements of the HASP.
- Eliminate unsafe conditions. Efforts must be initiated to identify conditions that can contribute to an accident and to remove exposure to these conditions.
- Reduce unsafe acts. Personnel shall make a conscious effort to work safely. A high degree of safety awareness must be maintained, so that safety factors involved in a task become an integral part of the task.
- Inspect frequently. Regular safety inspections of the work site, materials, and equipment by qualified persons ensures early detection of unsafe conditions. Safety and health deficiencies shall be corrected as soon as possible, or site activities shall be suspended.

The following guidelines describe those specific measures personnel shall take to minimize the occurrence of accidents on the subject site:

- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in the evacuation of site personnel and re-evaluation of the hazard and the level of protection.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited while working in an area where the potential for chemical and/or explosive hazards may be present. Personnel must wash and/or decontaminate thoroughly before initiating any of the aforementioned activities.
- Field investigation activities must be coordinated through the Health and Safety Officer (HSO), SSO, and the Senior Project Manager (SPM).
- Contact lenses will not be worn with any type of respirators.

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- Facial hair must not interfere with the fit of the respirator.
- Site activities will not be conducted with inadequate lighting.

11. EMERGENCY RESPONSE/ CONTINGENCY PROCEDURES

11.1 Emergency Equipment/First Aid

Basic first aid supplies (bandages, gauze, tape, biohazard disposal bags, gloves, goggles, face mask) will be located in the first aid box. The first aid box, along with a first aid manual and Medical Data Sheets, will be located in the Support Zone. Other on-site emergency equipment including emergency alarm, portable emergency eyewash, DEET spray solution (an insecticide for ticks), and a fire extinguisher shall be located in the Support Zone also.

11.2 Emergency Procedures for Contaminated Personnel

In the event of an on-site medical emergency, a decision must be made regarding decontamination if the injury occurs in an area of chemical contamination. There is a possibility that decontamination procedures may aggravate or cause more serious health effects.

For minor medical problems or injuries, the normal decontamination procedures should be followed.

If prompt life-saving first aid and medical treatment is required, decontamination procedures may have to be omitted. In such circumstances, the following guidelines should be used:

- If possible, remove outer protective coveralls and clothing by cutting away if necessary.
- If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic, blankets, etc. to prevent contaminating medical personnel and vehicles.
- If possible, a Weaver Boos representative from the project site should accompany the contaminated victim to the medical facility to advise on matters involving decontamination.

11.3 Emergency Telephone Numbers

In the event of a medical emergency, personnel will take direction from the HSO and notify the appropriate emergency organization. In the event of a fire or spill, the site supervisor will notify the appropriate local, state, and federal agencies. The following list provides names and telephone numbers for emergency contact personnel.

Table 8
Emergency Information

Organization	Telephone	Hospital Directions
Ambulance:	911	Proceed east 2,500 feet on E. Chicago Ave. to Euclid, north 2,000 feet on Euclid to E 144 th St., then east 1,500 feet on 144 th St. to hospital on north side of 144 th St. (see Figure 1 for directions).
Police:	911	
Fire:	911	
St. Catherine Hospital 4321 Fir Street East Chicago, Indiana 46312	(219) 392-1700	
WBG SPM: Peter Cambouris	Work: 312-922-1030 Cell: 312-656-3218	
WBG SPM: Eric Neagu	Work: 312-922-1030 Cell: 773-403-5137	
E. Chicago Project Manager: Lyvette Turk	Work: Cell:	
Poison Control Center	800-382-9097	
Regional EPA:	312-886-6159	
Indiana Emergency Management Agency	317-232-3980	
National Response Center	800-424-8802	
Center for Disease Control	404-488-4100	
Chemtrec	800-424-9555	

12. TRAINING REQUIREMENTS

12.1 General Training

If deemed necessary, personnel participating in or visiting the Facility shall provide verification that they have completed at least 40 hours of OSHA certified classroom-style safety hazardous worker training and 24-hours of on-site training, as required by OSHA 29 CFR 1910.120.

In addition, the SSO and the SPM shall receive an additional eight hours of supervisory training. Site employees shall receive a minimum of eight hours of refresher training annually.

12.2 Site-Specific Training

12.2.1 Initial Training

An initial site-specific training session or briefing, shall be conducted by the HSO or the SPM, prior to commencement of work and/or entering the site. Employees who will be on-site shall attend the site-specific training session or briefing. During this initial training session, employees shall be instructed on the following topics:

- Personnel responsibilities
- Content and implementation of the HASP
- Site hazards and controls
- Site-specific hazardous procedures (i.e., confined space entry, drum removal, etc.)
- Medical and training requirements
- Use of direct reading monitoring equipment
- Levels of personnel protection
- Action levels for upgrading/downgrading levels of PPE
- Emergency information, including local emergency response team phone numbers, route to nearest hospital, and emergency response procedures
- Instruction in the completion of required forms

12.2.2 Periodic Training

An on-site safety briefing shall be provided by the SSO prior to each change in operation. When applicable, the briefing shall review problems, which may have occurred on-site.

12.2.3 Visitor Training

Any visitors to the site will be required to undergo the same training program discussed above and will be required to sign a signoff sheet certifying they have received the required training.

12.3 Medical Monitoring/Surveillance

Medical screening provides a method of identifying those employees whose medical history indicates potentially increased health risk when exposed to chemicals present in the work environment. Medical screening directly and indirectly measures the functional activity of organs affected by potential chemical exposure during the work and includes physiological tests of parameters having a clinical relevance to potential chemical exposure.

Under OSHA regulations (29 CFR 1910.120(f)), a medical surveillance program is required for employees whose job functions take place in potentially hazardous areas that necessitate the use of respiratory protection for 30 days or more per year. By this measure, use of a respirator at any time during a workday, even if only for a few minutes, constitutes one day's use.

The field activities covered by this HASP do not generally envision a requirement for respiratory protection. Weaver Boos or contractor personnel may, however, have other job functions that require respiratory protection at or above the 30-day per year threshold. In this event, personnel using respiratory protection at or above the 30-day threshold will follow the medical surveillance program described in the following subsections. Additional biological monitoring may become necessary upon consideration of actual site conditions.

12.3.1 Baseline or Pre-assignment Monitoring

If medical monitoring is required for this project, prior to being assigned to a hazardous or a potentially hazardous activity involving exposure to toxic materials, each employee must receive a pre-assignment or baseline physical. The contents of the physical is to be determined by the employers medical consultant. As suggested by NIOSH /OSHA /USCG /EPA's. Occupational Safety & Health Guidance Manual for Hazardous Waste Site Activities the following are the minimum medical monitoring requirements for work at the subject properties.

1. Complete medical and work histories
2. Physical examination
3. Pulmonary function tests (FVC and FEV 1:FVC Ratio)
4. Chest X-ray (every 2 years)
5. EKG
6. Eye examination and visual acuity
7. Audiometry (Audiometric testing at 500, 1000, 2000, 3000, 4000, 6000 and 8000 Hertz, including an otoscopic examination of the ear for wax)
8. Urinalysis
9. Blood Chemistry, including hematology and serum analyses

The pre-assignment physical should categorize employees as fit-for-duty and able to wear respiratory protection.

12.3.2 Periodic Monitoring

If medical monitoring is required for this project, in addition to a baseline physical, employees require a periodic physical within the last twelve (12) months unless the advising physician believes a shorter interval is appropriate. The employer's medical consultant should prescribe an adequate medical which fulfills OSHA 29 CFR 1910.120 requirements. The pre-assignment medical outlined above may be applicable.

Personnel working in contaminated or potentially contaminated areas at the subject properties will verify currency (within 12 months) with respect to medical monitoring. This is done by indicating date of last physical on the safety plan agreement form.

12.4 Site Specific Medical Monitoring

For activities at the subject properties, no specific tests will be required prior to individuals entering the Exclusion Zone or Contamination Reduction Zone. However, additional biological monitoring may become necessary upon consideration of actual site conditions.

12.5 Exposure/Injury/Medical Support

If medical monitoring is required for this project, as a follow-up to an injury or possible exposure above established exposure limits, employees are entitled to and encouraged to seek medical attention and physical testing. Depending upon the type of exposure, it is critical to perform follow-up testing within 24-48 hours. It will be up to the employer's medical consultant to advise the type of test required to accurately monitor for exposure effects.

12.5.1 *Exit Physical*

At termination of employment or reassignment to an activity or location that does not represent a risk of exposure to hazardous exposures, an employee shall require an exit physical. If his /her last physical was within the last six (6) months, the advising medical consultant has the right to determine adequacy and necessity of an exit exam.

12.5.2 *Certification of Employee Fitness*

If hazardous waste site work is to be performed, the HSO shall obtain a copy of the physician's written opinion about the employee's ability to perform hazardous waste site work and wear respiratory protection. The opinion shall contain:

- Recommended limits upon the employee's assigned work (i.e., no heavy lifting, employee con not wear a respirator).
- Any possible increase of risk to employee's health resulting from work.
- A statement that the employee has been informed and advised about the results of the examination.

13. WEATHER RELATED PROBLEMS

13.1 Heat Stress

Heat-related problems occur when the body's physiological process fails to maintain a normal body temperature due to excessive heat and/or humidity. A number of physical reactions can occur ranging from fatigue, irritability, anxiety, and decreased dexterity, to nausea, unconsciousness, coma, and death. Weaver Boos personnel must be capable of recognizing the onset of heat stress disorders as outlined below.

13.1.1 Recognition of Symptoms

1. Heat rash results from continuous exposure to heat or humid air.
2. Heavy sweating, with inadequate electrolyte replacement causes heat cramps. Signs and symptoms include:
 - a) Muscle spasms
 - b) pain in hands, feet, and abdomen
3. Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
 - a) Pale, cool, moist skin
 - b) heavy sweating
 - c) dizziness nausea
 - d) fainting
4. Heat stroke is the most serious of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occurs. Professional medical assistance must be obtained. Signs and symptoms are:
 - a) Red, hot, unusually dry skin
 - b) lack of or reduced perspiration
 - c) nausea
 - d) dizziness and confusion
 - e) strong, rapid pulse

f) coma

13.1.2 Work Practices

Weaver Boos shall use one or more of the following control measures to prevent the onset of heat stress.

1. Water or electrolyte supplement drink shall be provided for body fluid replacement.
 - a) Workers should drink approximately 16 ounces of fluid before work and one or two cups at each break. A total of 1 to 1.6 gallons of fluid per day are recommended, but more may be necessary to maintain body weight.
2. Establishment of a work routine that will provide adequate rest periods for cooling down and gradual acclimatization.
3. Ice vests or other cooling devices may be worn under protective clothing.
4. Breaks shall be taken in a cool area if possible. A portable canopy may have to be erected if no shade is naturally available.
5. Employees shall not be assigned other tasks during rest breaks.
6. Employees shall be informed of the importance of adequate rest, acclimatization, and proper diet in the prevention of heat stress.

13.1.3 Acclimatization

The level of heat stress at which excessive heat strain will result depends on the heat tolerance capabilities of the individual worker. Each worker has an upper limit for heat stress beyond which the resulting heat strain can cause the worker to become a heat casualty. In most workers, appropriate repeated exposure to elevated heat stress causes a series of physiologic adaptation called acclimatization, whereby the body becomes more efficient in coping with the heat stress. Work/rest regimen will be partially determined by the degree of acclimatization provided.

13.1.4 Work/Rest Regimen

The work/rest regimen is shown in Table 9.

Table 9
Work/Rest Regimen for Heat Stress

WBGT	Acclimatization (days)	Work/Rest Regimen/Hour (%) Level "D"	Work/Rest Regimen/Hour (%) Level "C" ⁽¹⁾	Work/Rest Regimen/Hour (%) Level "B" ⁽²⁾
77°F	0 to 3 >3	Continuous	Continuous	75 / 25 Continuous
84°F	0 to 3 >3	Continuous	75 / 25 Continuous	50 / 50 75 / 25
88°F	0 to 3 >3	75 / 25 Continuous	50 / 50 75 / 25	25 / 75 50 / 50
90°F ⁽³⁾	0 to 3 >3	50 / 50 75 / 25	25 / 75 50 / 50	No work 25 / 75
94°F ⁽⁴⁾	0 to 3 >3	25 / 75 50 / 50	No work 25 / 75	No work
98°F ⁽⁵⁾	0 to 3 >3	No work 25 / 75	No work	No work

NOTES:

WBGT - Wet Bulb Global Temperature

- (1) - Used also for Level "B" work using Saranex/Tyvek suits and ice vests
- (2) - Used also for Level "B" work using Saranex/Tyvek suits, no ice vests
- (3) - No Level "B" work conducted in temperatures above 90°F.
- (4) - No Level "C" work conducted in temperatures above 94°F.
- (5) - No Level "D" work conducted in temperatures above 98°F.

13.1.5 Worker Information Training

New and current employees who work in areas where there is a reasonable likelihood of heat injury or illness should be kept informed, through continuing education programs of:

- Heat stress hazards
- Predisposing factors and relevant signs and symptoms of heat injury and illness.
- Potential health effects of excessive heat stress and first aid procedures.
- Proper precautions for work in heat stress areas.

- Worker responsibilities for following proper work practices and control procedures to help protect the health and safety of themselves and their fellow workers, including instruction to immediately report to the employer the development of signs or symptoms of heat stress overexposure.
- The effects of therapeutic drugs, over-the-counter medications, or social drugs, may increase the risk of heat injury or illness by reducing heat tolerance.

13.2 Cold Stress

Like heat stress, exposure to cold can produce serious effects upon workers at a hazardous waste site. Although it is possible to protect oneself from cold exposure by the use of clothing, some impermeable protective garments trap moisture against the body and increase the likelihood of cold stress. Wind can also increase the likelihood of cold stress and frostbite (refer to Table 10 for cooling power of wind on exposed flesh).

13.2.1 *Recognition and Symptoms*

1. Frostbite is the most common form of cold stress. The extremities are most often affected. Signs and symptoms of frostbite include:
 - a) White or grayish-yellow skin.
 - b) Pain which subsides to numbness.
 - c) Affected body part feels very cold.
2. Hypothermia is the lowering of the individual's internal body temperature to a dangerous level. Prompt warming of the body, and medical assistance are necessary to prevent serious injury or death. Typical symptoms include shivering, numbness, drowsiness, muscular weakness, and unconsciousness.

13.2.2 *Work Practices*

A common sense approach is the most effective means of preventing the onset of cold stress. In general, Weaver Boos personnel shall use one or more of the following control measures.

1. Dress in several layers of thin clothing rather than one thick layer. Several layers of clothing create air pockets, which help to insulate.
2. Observe work/warming regimen as shown in Table 11.

3. Wear inner layers of clothing such as polypropylene or silk long underwear to keep moisture away from the skin.
4. Breaks shall be taken in a warm rest area if possible. This may be an office trailer or the cab of a truck.
5. If clothing becomes wet, dry replacements shall be donned.
6. If personnel become chilled or their extremities becomes painful or numb, they shall be removed from the cold environment until warm.
7. If the air temperature is 32°F or less, hands should be protected by gloves.
8. Warm sweet drinks (hot chocolate) and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of the diuretic and circulatory effect.
9. The weight and bulk of clothing should be included in the estimating the required work performance and weights to be lifted by the worker.

13.2.3 Worker Information and Training

The on-site personnel will be instructed in safety and health procedures regarding cold work environments. The training program should include, at a minimum, instruction in:

- Proper re-warming procedures and appropriate first aid treatment.
- Proper clothing practices.
- Proper eating and drinking habits.
- Recognition of impending frostbite.
- Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
- Safe work practices.

13.3 Adverse Weather Conditions

The SSO shall decide on the continuation or discontinuation of work based on current and pending weather conditions. Electrical storms, tornado warnings, and strong winds are examples of conditions that would call for the discontinuation of work and evaluation of site.

FIGURES